

REMARKS

Claims 18-26 were pending in this application. In the non-final Office action mailed September 7, 2011, the Office rejects all of these claims as being an obvious combination of the Purnell et al. patent (U.S. patent 5,062,908) and the Brophy patent (U.S. patent 1,799,500).

In this response, the Applicants present remarks indicating why the claims are patentably distinct from the cited combination of prior art. Additionally, new claims 27-32 are presented for consideration by the Examiner. The Applicants respectfully request reconsideration and allowance of the claims 18-32 as presented above.

Information Disclosure Statement

Submitted herewith is an Information Disclosure Statement. The two references cited therein were first cited in an Examination Report from India. Consideration of these references is respectfully requested by the Examiner.

Claim Rejections Under 35 U.S.C. § 103(a)

In the non-final Office action, the Office rejected independent claim 18 as being an obvious combination of the Purnell et al. patent and the Brophy patent. The Applicants respectfully disagree.

Independent claim 18 relates to a method of using locating elements to position an infiltrant blank on a powder metal compact. The claimed structure provides for more accurate and precise infiltration of a compact by restricting the movement of the infiltrant blank relative to the compact.

Combining the Purnell et al. patent and the Brophy patent would not reasonably result in one of ordinary skill in the art arriving at the claimed invention without the benefit of the

Applicants' specification. The Purnell et al. patent relates to rolling a sheet of infiltrant material and then inserting this strip of material into a through hole of a generally tubular valve body. The Brophy patent relates to a roofing shingle for a building in which a metal sheet is formed to have a profile that conforms to a base portion of a tile onto which it is received.

This proposed combination of the references is unworkable because it ignores limitations on part geometry imposed by the powder metal processes used to form the powder metal compacts. Powder metal compacts are typically formed via uni-axial compression of powder metal into a compact. In order to form a valve of the type found in the Purnell et al. patent application, the compaction tooling would include a vertically-disposed core rod that defines the radially inwardly face of the tubular valve guide. If one were to attempt to form crests and depressions in this inner diameter in the manner suggested by the Office, they would need to do so on the radially outward facing part of the core rod. However, to do this would ultimately prevent the core rod from being cleanly withdrawn from the powder metal compact during the compaction step.

As still another consideration, making the change to the Purnell et al. patent proposed by the Office both (1) renders the Purnell et al. patent unsatisfactory for its intended purpose and (2) destroys the principle of operation of the part in the Purnell et al. patent. According to MPEP § 2143.01(V) and (VI), this means that the proposed modification cannot be obvious.

The Purnell et al. patent relates to the infiltration of an inner diameter of a valve guide. This valve guide receives a co-operating valve stem and the inner diameter is subjected to sliding and wear and therefore must have good dimensional

control and predictable surface quality. See e.g., col. 1, lines 8 through 35 and col. 3, lines 39 through 45 of the Purnell et al. patent. To introduce crests and troughs into this inner diameter surface (as the Office proposes it would be obvious to do when the Brophy patent is further considered) would introduce flaws to the cylindrical shape of the inner diameter surface of the valve guide given its final requirements and function. Given that this inner diameter should be shaped to accommodate sliding and to have good dimensional control and predictable surface quality, the introduction of crests and troughs would be unacceptable.

Furthermore, even if crests and troughs were introduced into the inner diameter of the valve guide of the Purnell et al. patent, then it is difficult to understand how the roll of infiltrant material could be made to have corresponding crests and troughs. As the infiltrant material is initially planar and then rolled, any crests and troughs would inhibit the deformation of the infiltrant during rolling. Additionally, because the infiltrant material is slid into the inner diameter, such crests and troughs would inhibit the smooth insertion of the infiltrant material.

Thus, it is respectfully asserted that it would not be obvious to combine the Purnell et al. patent and the Brophy patent to arrive at the claimed invention. It is only with the benefit of hindsight and consideration of Applicants' specification that such a combination might even be contemplated in the first instance and, even then, this combination would be unworkable for the various reasons stated above.

Accordingly, the rejection of independent claim 18 and all claims depending therefrom should be withdrawn.

New Claims

In this response, new claims are also presented.

Dependent claims 27 through 29 are presented which depend from independent claim 18. These claims are presented to further highlight some aspects of the process which differ from the teachings of the prior art of record. Claim 27 recites that the infiltrant blank is flat and extends along a plane when placed in contact with the compact. This is in contrast to the infiltrant material of the Purnell et al. patent which is formed into a tubular roll before being inserted into a central through hole of a valve guide. Claim 28 further recites the structure of the compact, indicating that the compact has a central opening extending axially there through and has an annular top axially facing surface with an annular recess formed therein. Claim 28 further recites that the infiltrant blank is placed in the annular recess of the annular top axially facing surface. Again, nothing in the references cited by the Office shows the recess as being formed on an annular top axial surface of the compact. Claim 29 further requires that the blank includes a tab that extends outwardly and that the recess includes a portion that receives the tab in a mating relationship.

Additionally, a new independent claim 30 and dependent claims 31 and 32 which depend there from are presented for consideration. Among other things, these process claims recite the form of the compact (i.e., has a central opening extending axially there through and has an annular top axially facing surface with an annular recess formed therein) and recite that an annular infiltrant blank is placed in the annular recess of the annular top axially facing surface. To date, the Office has not shown infiltration of a compact in which an axial end of the compact supports the infiltrant material as required by this claim.

Conclusion

In view of the remarks above, it is believed that the application is in condition for allowance. The undersigned requests a telephonic interview with the Examiner to discuss the status of the application and to provide any assistance necessary in consideration of this response.

No fees are believed to be due at this time. However, in the event that any fees are due, including fees for an extension of time or for the presentation of excess claims, then please charge these fees to Deposit Account No. 17-0055.

Respectfully submitted,

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